A NEW VARIETY OF *IPOMOEA COSTELLATA* (CONVOLVULACEAE) FROM THE EDWARDS PLATEAU REGION OF TEXAS

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ABSTRACT

Ipomoea costellata var. ***edwardsensis***, var. nov., is described, illustrated, and mapped. It apparently is endemic to the Edwards Plateau region of Texas, where it is known from six counties. It is set apart from *I. costellata* elsewhere in its range by its combination of shorter peduncles and bright white, nearly rotate flowers with fewer and deeper lobes.

RESUMEN

Se describe, se ilustra y se cartografía ***Ipomoea costellata*** var. ***edwardsensis***, var. nov. Es aparentemente endémica de la región de la meseta Edwards de Texas, de donde se conoce de seis condados. Se separa de *I. costellata* por su combinación de pedúnculos más cortos y flores blanco brillante, casi rodadas con menos lóbulos y más profundos.

Plants of a small-flowered, pedatisect-leaved morning glory from the Edwards Plateau region of Texas are identified as *Ipomoea costellata* Torrey but are distinct from other plants of the species in morphology, phenology, and geography. The Edwards Plateau plants are here recognized as a distinct variety.

Ipomoea costellata Torrey var. **edwardsensis** O'Kennon & Nesom, var. nov. (**Figs. 1, 2, 3**). TYPE: U.S.A. TEXAS. TRAVIS CO.: Colorado River, Montopolis Bridge, 8 Nov 1934, *B.C. Tharp s.n.* (HOLOTYPE: TEX).

Differt a *I. costellatae* Torrey sensu lato pedunculis brevioribus longitudine petiolum aequantibus et corollis albis rotatis lobis paucioribus profundioribus.

Plants annual herbs from a filiform taproot, at first erect, becoming prostrate or clambering on low vegetation, slightly twining at the very tips. ***Stems*** simple or with 1–5 (or more) branches originating ca. 2–4 cm above the base, terete, 3–60 cm long, 0.5–1 mm in diameter, branching, green, glabrous. ***Leaves*** pedatisect, 2–3.5 cm wide, petioles 7–25 mm long, nearly even in length or decreasing slightly from base to apex of stem, glabrous, ultimate leaf segments 7–9(–11), linear to linear-lanceolate, unequal, the longest 15–24 cm long, 1.5–3 mm wide, outer shorter than the inner and usually lobed from near the base, green above and beneath, glabrous, margins entire, sparsely hispid-ciliate, apices acute, apiculate. ***Flowers*** solitary or less commonly paired; peduncle spreading to slightly decurved or ascending, terete, filiform, 3–22 mm long, green, glabrous to sparsely

FIG. 1. Habit and floral details of *Ipomoea costellata* var. *edwardsensis* (from *O'Kennon 8125*).

FIG. 2. Photographs of *Ipomoea costellata* var. *edwardsensis* flowers (from *Nesom FW99* and *O'Kennon*).

hispid-pilose; pedicel 6–8 mm long, slightly thicker than the peduncle, separated from the peduncle by a pair of awl-shaped bracts, glabrous to sparsely hirsute-pilose; sepals equal, subimbricate, elliptic to elliptic-lanceolate, 4–5.2 mm long, 1.5–2 mm wide, midrib green, low-carinate, smooth to muricate, margins entire, hyaline, the apex rounded to retuse, apiculate; corolla tubular to long-campanulate, all parts bright white, glabrous, 8–11 mm long, tube 4–5 mm long, 2 mm in diameter, limb with 5 oblong-ovate, apiculate, spreading lobes 2–2.5 mm long, flowers opening with lobes nearly erect, spreading at right angles at full anthesis, closing erect past maturity; stamens subequal, white, filaments pubescent along whole length with long, viscid trichomes; style white, 4.5 mm long (equaling the filament length), glabrous, stigma white, slightly bilobate, apparently in contact with the anthers. ***Fruits*** bilocular dehiscent capsules 5–6 mm in diameter, tan upon drying, chartaceous, glabrous; seeds 4, dark brown to blackish, obovoid, 3-angled, ca. 3 mm long, 2 mm wide, densely and minutely strigose.

Additional collections examined. **United States. Texas. Bexar Co.:** Government Canyon State Natural Area, E side of Wildcat Canyon, E edge of San Geronimo Quad or W edge of Helotes Quad, 'guesstimated' lat/long—29° 33'51" N, 98° 45'00" W, elev. 1200–1240 ft, rare, two plants seen among sparse herbaceous vegetation in very shallow dark brown clay in natural opening on Cretaceous limestone bedrock exposed on flattest part of ridgetop, associates include *Sporobolus vaginatus*, *Bothriochloa ischaemum* var. *songarica*, *Croton monanthogynus*, *Senna lindheimeriana*, 24 Oct 1995, *Carr 15050* (TEX). **Burnet Co.:** N of RM Road 1431, 1.8 road mi WNW of US Rte 281, Marble Falls Quad, local in thin, fairly dry, organic-sandy soil in unshaded weather pit on low granite outcrop, ca. 1500 ft elev., annual, stems twining only at tips of taller plants, 18 Aug 1988, *Carr 9136* with Kutac, Lynch, and Brown (TEX); RM Road 1431, 1.7 mi W of jct with US Rte 281 in Marble Falls, area of exposed granite, N side of road across from large quarry, 23 Oct 2001, *Nesom FW99* and O'Kennon (BRIT, TEX). **Gillespie Co.:** Onion Creek Bluff, 400 m E of FM 783 in NW Gillespie Co., scarce in limestone crevices 10 m above Onion Creek, 19 Oct 1990, *O'Kennon 8125* (BRIT). **Llano Co.:** near the summit of Dutch Mountain, ca. 1.5 mi N of Enchanted Rock, infrequent vine, 29 Sep 1976, *Butterwick and Lamb 3303* (TEX). **Travis Co.:** Austin, Colorado River below Dam, 29 Sep 1929, *Ecology Class s.n.* (TEX); Austin, Onion Creek, 15 Oct 1929, *Whitehouse W-29-3* (TEX); McKinney Falls State Park, S of Onion Creek at mouth of Williamson Creek, frequent, locally abundant in thin soil in weather pits on exposed calcareous bedrock, ca. 100–300 ft, 29 Oct 1985, *Carr 7050* (BRIT, TEX). **Uvalde Co.:** 2.1 mi W of jct of FM 127 and FM 1049 on FM 127, dry limestone ledge, 2 Nov 1985, *Keeney 5371* (BRIT).

Etymology.—The epithet alludes to the location of the plants on the Edwards Plateau.

Distribution, habitat, and phenology.—Collections at hand indicate that *Ipomoea costellata* var. *edwardsensis* is distributed over the Edwards Plateau, although the plants are apparently uncommon and inconspicuous. Shinners' treatment of Texas *Ipomoea* (1970) noted only that *I. costellata* occurs in the trans-Pecos region, although in 1960 he annotated the three early collections from Travis County (1929 and 1934, cited above) as *I. costellata*; McDonald (1995) did not map or cite any collections of *I. costellata* from the Edwards Plateau. We suspect that searches for var. *edwardsensis* will broaden its known distribution

but confirm that it is endemic to the Edwards Plateau. Limestone ledges and crevices, and thin soil of weather pits in bedrock of limestone and granite, 100–1500 ft elev. Flowering (August–)September–November. We observe that var. *edwardsensis* apparently is particularly sensitive to grazing.

Ipomoea costellata (excluding var. *edwardsensis*) occurs in Texas in the trans-Pecos region and in Webb Co. (Fig. 3), continuous with its distribution in the Mexican states of Chihuahua and Coahuila. It is recorded from all of the northernmost states of Mexico (Sonora, Chihuahua, Coahuila, Nuevo León, and Tamaulipas) except Baja California and continues southward to Guatemala (see McDonald 1995, Fig. 2). Austin and Huáman (1996) reported its occurrence also in Venezuela but not Guatemala.

A recent taxonomic revision (McDonald 1995) treats *Ipomoea costellata* and seven closely related species within *Ipomoea* sect. *Leptocallis* (G. Don) J.A. McDonald, and another species has been recently added (Austin & Tapia Muñoz 2001). *Ipomoea costellata* is distinct within sect. *Leptocallis* in its annual, taprooted habit and small flowers (ca. 1 cm long). *Ipomoea costellata* alone in the section is autogamous—self-pollination is facilitated by the stigma in contact with stamens. Variety *edwardsensis* also has this reproductive arrangement and is obviously closely related to the rest of the species, but its geographic separation and set of differences (couplet below) provide a reasonable basis for formal taxonomic recognition.

Peduncles 3–22(–30) mm long, peduncle plus pedicel mostly shorter than or equal to the subtending leaf, ca. equal the petiole length; corollas bright white, with five, oblong-ovate lobes; flowering (Aug–)Sep–Nov _____ **Ipomoea costellata** var. **edwardsensis**

Peduncles (15–)27–70 mm long, peduncle plus pedicel mostly 1.5–3 times longer than the subtending leaf; corollas pink, purple, bluish, white, or yellow, with ten, shallowly rounded lobes; flowering (Jun–)Jul–Oct _____ **Ipomoea costellata** var. **costellata**

Ipomoea flowers are fragile and commonly are not useful for taxonomic distinctions in pressed specimens. We emphasize the short peduncle length, especially of mature fruits, as the most obvious and easily observed feature to distinguish var. *edwardsensis*. Scattered plants of *I. costellata* sensu lato (var. *costellata*) may have peduncles approaching the short length of var. *edwardsensis*, but the latter (as a population system) is set apart from rest of the species by this feature.

The flower color of *Ipomoea costellata* was described by McDonald (1995) as "blue, or rarely yellow throughout." Other sources note the following: "pale lavender" (Texas—*Whitehouse 17154*, SMU), "pale pink" (Texas—*Turner et al. 53447*, SMU), "reddish" (Texas—*Keough 227*, TEX), "purple" (Texas—*Butterwick and Lamb 1759*, TEX), "rose-purple" (New Mexico—Martin & Hutchins 1981), lavender (photo of Texas plant—Rickett 1969), "limb pale pink, throat and tube near white" (New Mexico—*Spellenberg 3852*, LL), "lavender or purplish, tube paler" (Sonora—Wiggins 1964), "tube lavender, purple near tips, yellow-white

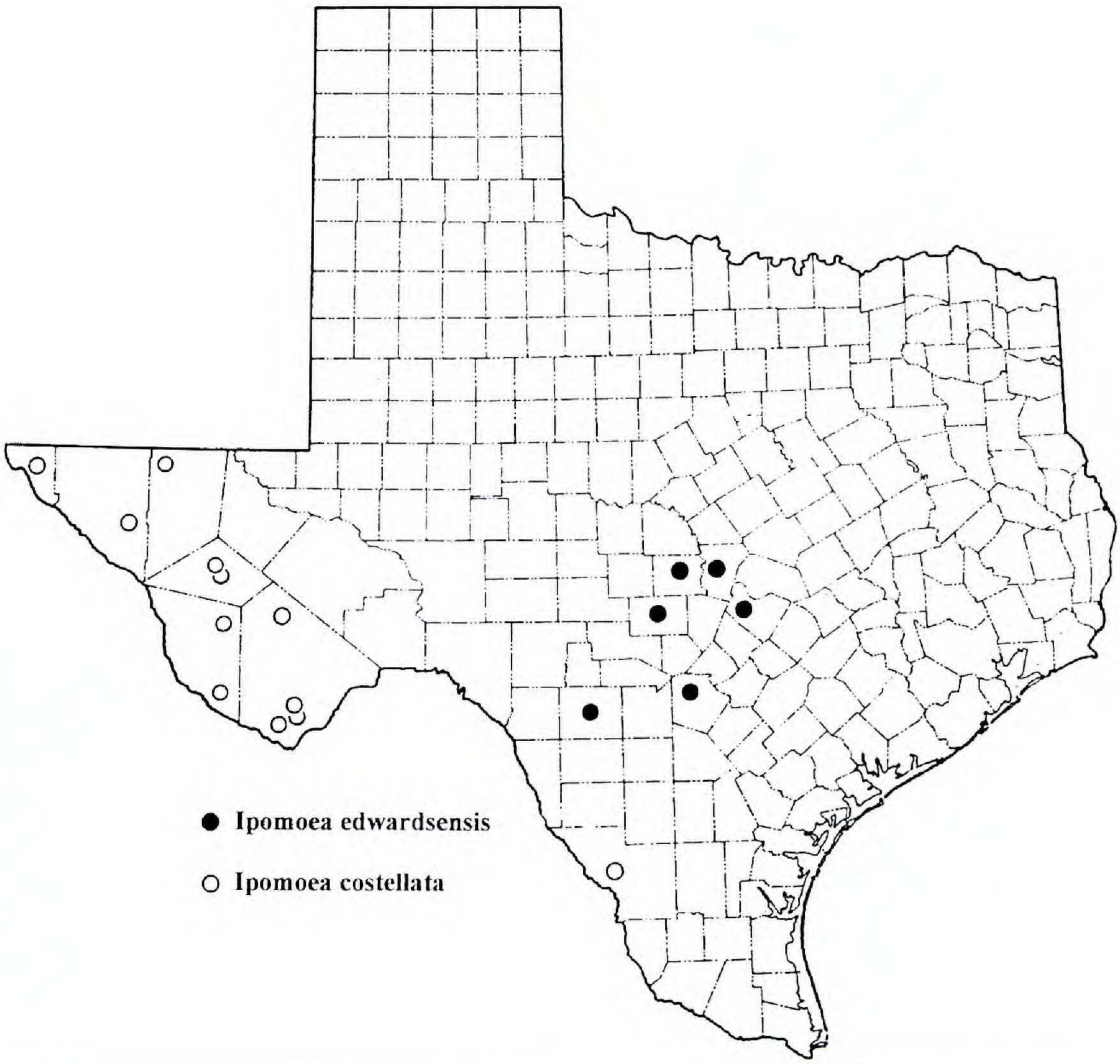

FIG. 3. Distribution of *Ipomoea costellata* var. *edwardsensis* and *I. costellata* var. *costellata* in Texas. The range of var. *costellata* continues westward to Arizona and southward to Guatemala (see text). Records are from BRIT-SMU and TEX-LL.

at base" (Chihuahua—*Henrickson 7557*, TEX), "yellow tube, purple-red limb" (Chihuahua—*Henrickson 7692*, TEX), "cream with green-yellow throat" (Coahuila—*Wendt 1783*, TEX), and "pale blue" (Chiapas—*Breedlove 52353*, TEX). Plants in the vicinity of Edo. Mexico produce yellow flowers (according to McDonald) and have been segregated as *I. painteri* House—this taxon was included in the synonymy of *I. costellata* by McDonald but treated as distinct by Rico R. (1985), who described the flower color of *I. painteri* as white or creamy. Plants in Nuevo León and Tamaulipas also apparently produce white flowers and are further distinguished within the species by thick taproots and apparently perennial duration; peduncles of these plants are long.

The corolla morphology of var. *edwardsensis* also is distinctive from any we are aware of within *Ipomoea costellata* and certainly from populations of the species on the periphery of var. *edwardsensis* in Texas and northern Mexico.

In var. *edwardsensis*, the limb is deeply and relatively narrowly lobed, and at full anthesis, the lobes spread at nearly right angles to the tube (Fig. 2). The line drawing (Fig. 1) shows a flower as it appears in early anthesis, just opening. Flowers of *I. costellata* elsewhere in its range apparently have ten, shallow lobes and the limb is funnelform, widening gradually toward the apex (Rickett 1969, pl. 99; Warnock 1977, Fig. 6, p. 178)—"corolla campanulate ... limb subentire, scantily 10-lobate," as described by McDonald (1995, p. 106).

Variety *edwardsensis* is clearly a 'satellite' of the larger and variable *I. costellata* sensu lato. Recognition of var. *edwardsensis* emphasizes its relative internal consistency and its morphological and geographical distinction from the rest of the species. Other recognizable geographic variants, particularly as distinguished by flower color, have been formed within *I. costellata*, this process perhaps quickened by the apparent tendency for autogamy. Formal recognition of the Edwards Plateau populations implies that other geographic segments of *I. costellata* might also be justifiably recognized (McDonald pers. comm.), and we agree with this.

McDonald (1995) did not provide a formal statement of his concept of varietal versus specific rank within sect. *Leptocallis*, but several species in his treatment include geographically distinct varietal taxa separated by one to several apparently non-intergrading morphological characters. In contrast, Yatskievych and Mason (1984) recognized two varieties within *I. tenuiloba* Torrey (of sect. *Leptocallis*) that are morphologically intergrading, this taxonomy accepted by McDonald. Yatskievych and Mason also observed that *I. tenuiloba*, *I. capillacea* (Kunth) G. Don, and *I. plummerae* A. Gray (including *I. patens* (A. Gray) House) constitute "a very close-knit species complex." With further consideration of the rationale for applying ranks within sect. *Leptocallis*, we believe that the Edwards Plateau variety of *I. costellata* eventually may be treated at higher rank.

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